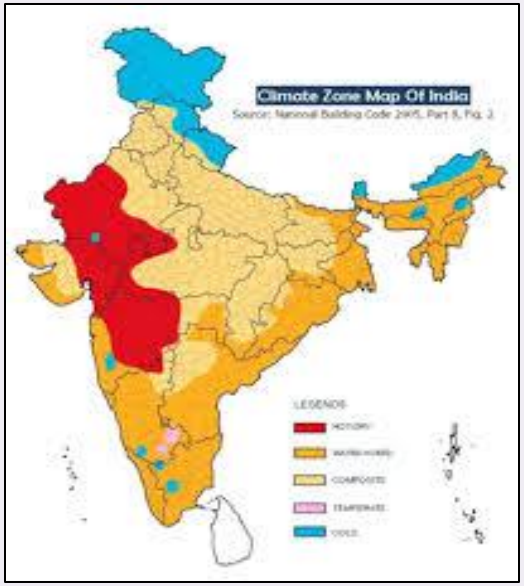


Based on the data collected from different categories of commercial buildings, the following tables show the indicative EPI benchmarks.

EPI benchmarks for Office Buildings

Climate Zone	Less than 50% AC	More than 50% AC
EPI (kWh/m²/yr)		
Warm & Humid	101	182
Composite	86	179
Hot & Dry	90	173
Moderate	94	179

EPI benchmarks for Shopping Malls

Climate Zone	EPI (kWh/m²/yr)
Warm & Humid	428
Composite	327
Hot & Dry	273
Moderate	257

EPI benchmarks for Hospitals

Climate Zone	EPI (kWh/m²/yr)
Warm & Humid	275
Composite	264
Hot & Dry	261
Moderate	247

EPI benchmarks for Hotels

Climate Zone	Upto 3 star	Above 3 star
EPI (kWh/m²/yr)		
Warm & Humid	215	333
Composite	201	290
Hot & Dry	167	250
Moderate	107	313

EPI benchmarks for Institutes

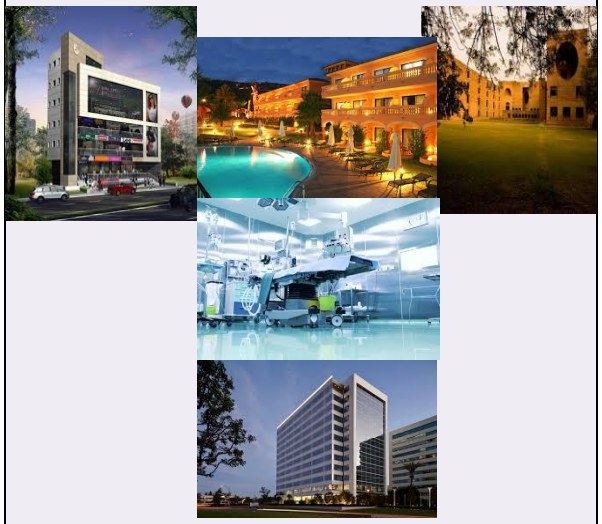
Climate Zone	EPI (kWh/m²/yr)
Warm & Humid	150
Composite	117
Hot & Dry	106
Moderate	129

EPI benchmarks for BPOs

Climate Zone	EPI (kWh/m²/yr)
Warm & Humid	452
Composite	437
Hot & Dry	-
Moderate	433

Disclaimer : The EPI benchmarks should be considered as an Indicative figure as it largely depends upon the operating hours, energy efficiency measures, sample size, climatic zone and lack of detailed information by building owners.

Energy benchmarks for Commercial Buildings



Bureau of Energy Efficiency
4th Floor, Sewa Bhawan, R.K. Puram,
New Delhi – 110066
Website : www.beenet.in

Message

For a developing country like India, the demand for energy is going to increase in the years ahead. With rapid urbanization and growth in the building infrastructure, energy demand in buildings is also going to increase many fold. Consequently, it is critical that energy efficiency in the building sector is pursued through a policy and regulatory regime to harness the enormous potential of energy savings.

In terms of the saving potential, building sector in India offers a huge opportunity through efficient building design and use of efficient appliances and equipment. Availability of adequate and credible data is extremely essential for developing an effective policy framework. Energy benchmarking of buildings can help in creating a whole building energy consumption profile of a group of buildings characterized by their primary use, construction, physical, geographic and operating characteristics. UNDP-GEF project undertook an exercise for collection of data for upcoming and existing commercial buildings throughout India for its analysis and establishment of energy performance benchmarks for various categories of buildings keeping in mind the climatic zones in which they are located. These benchmarks should be continuously enhanced from time to time, in keeping with the advancements in energy efficient construction practices and technologies.

Ajay Mathur
Director General
Bureau of Energy Efficiency

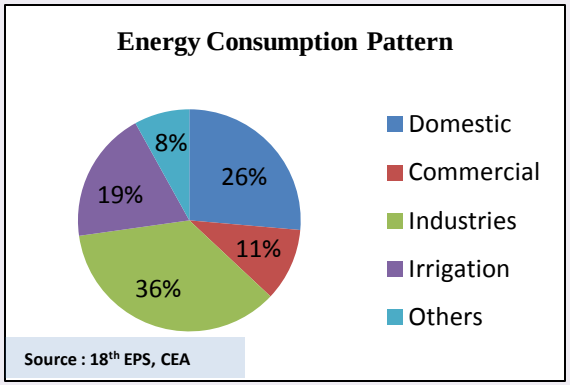
UNDP-GEF-BEE Project

UNDP-GEFs intervention aims to address the barriers and assist the Government to implement and operationalize the ECBC through a comprehensive and integrated approach that will focus on (a) Strengthening of institutional capacities at various levels to implement ECBC and other energy efficiency programs for commercial buildings; (b) Developing technical expertise and awareness raising of key partners; (c) Compliance with ECBC demonstrated in 8 model buildings (with a total floor area of 1.47 million m2) one in five climatic zones; (d) Formulating fiscal and regulatory incentives for investors and (e) Monitoring evaluation; knowledge sharing and learning.

Under the project, a study on collection of data for upcoming and existing commercial buildings throughout India was conducted for identifying measures which are required for wide scale implementation of ECBC in built environment. In terms of amendment to the Energy Conservation Act 2001, buildings having a connected load of 100 kW and above or contract demand of 120 kVA and above have been considered within the scope of the study.

Building Sector in India

India has doubled its floor space between 2001 to 2005 and expected to add 35 Billion square meter of new buildings by 2050. Currently, buildings account for 35% of total energy consumption and growing at 8%[#] annually. As per a report of the Royal Institution of Chartered Surveyors (RICS), 4127 million square meter of real estate space (which includes residential, retail, offices, hotels, health care and education sectors) is expected to be built between 2012 and 2020 which is on an average construction of 460 Million square meter of real estate space per year. Lack of statistical data of the Indian building sector like stock of existing buildings, upcoming buildings, energy consumption of buildings, etc. is not only a deterrent in adequate and effective policy making but is also a hindrance in monitoring progress of schemes and evaluation of their impact. There is an urgent need to improve the existing system for collection and management of building sector related data.



Objective & Scope of Work

The intent of conducting study on collection of data for upcoming and existing commercial buildings throughout India, is for finding measures that are required for wide scale implementation of ECBC in built environment to achieve the target of 75% of all new starts of commercial buildings are ECBC compliant by end of the 12th five year plan period, Administration & Enforcement of ECBC Implementation through notification of commercial buildings as designated consumers and all new commercial buildings being ECBC complaint. As per amendment of Energy Conservation Act 2001 in the year 2010, buildings having connected load of 100 KW and above or contract demand of 120 KVA and above have been targeted for this study.

http://eecbindia.com/

Keeping this in mind the objective of this study is to:

- Develop a robust mechanism to create an institutional framework for the collection and analysis of data.
- Prepare a baseline for existing commercial buildings to assess energy consumption based on the building type, hours of use and climatic zone.
- Project the annual addition of new construction growth in this sector in the current five year plan and estimate the energy savings potential. The effort is expected to provide benchmarking indices that can be used by policy makers, building designers, ESCOs, energy auditors, energy analysts and researchers to get a better understanding of energy use in this sector.
- Also to develop portal for disseminating continuous information for the latest updates.

Key Findings & Limitations

Total 1160 commercial buildings, data has been collected from across all the climatic zones covering commercial buildings such as Offices, Hotels, Hospitals, BPOs, and Shopping Malls on random sampling basis.

During analysis, it has been observed that commercial buildings in various categories with higher EPIs were generally smaller-sized buildings with long operating hours using split-unit air-conditioning or air cooled centralised chiller systems.

However, further studies would be required to establish the co-relation between EPI and various factors impacting the energy performance of a building.

Limitations include dynamic nature of operation of buildings, lack of information, reluctance shown by Building owners in sharing information and unfamiliarity with the information required.